The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Fertilisers and Farming

THE Royal Society of Arts has the peculiar and important function of surveying the whole range of the Arts and Sciences of mankind without specialisation in narrow fields, though its membership comprises men of eminence in every field. In these days of specialisation the importance of considering all sides of a subject is sometimes overlooked, and it is an advantage to gain the wide view which is secured by discussion of papers before a Society having such varied interests. This advantage is well illustrated by two papers on the subject of humus, one of which, by Lt.-Col. F. C. Temple, has been discussed in THE CHEMICAL AGE (*44*, 1128, 83). In this paper proposals were made for the utilisation of waste products to restore humus to the land. In another paper read before the Society Mr. G. V. Jacks, Deputy Director of the Imperial Bureau of Soil Science at Rothamsted, discussed the subject of "Humus and the Farmer" with special reference to fertilisation.

Mr. Jacks pointed out that humus is the organic matter present in every soil and is composed of the decaying residues of plants—usually of the plants that previously occupied the soil. Animal excreta are also, of course, ultimately of plant origin. Humus contains the nitrogen and minerals which the living plants absorbed from the soil, and thus provides a very complete mineral diet for plants, particularly for those of the kind that produced the humus. It is also a store of the solar energy absorbed by plants in the synthesis of their green parts and utilised in the soil for the sustenance of the microbiological population which decomposes humus. But probably the most important, and certainly the most obvious effects of humus are on the soil's physical properties. Humus in the soil keeps the rock particles separate, puffs the soil up, and allows air and water to circulate according to the needs of the plants that produce it. Humus, in fact, does many things, all of which can be summed up in the statement that it makes a mass of otherwise dead rock particles a suitable habitat for living plants. A forest produces its own particular type of humus which sets up in the soil the particular physical and biological conditions required for the survival of the forest. As contrasted with this forest humus, grasses produce a fabulously fertile soil of granular structure rich in plant food, of high porosity and absorbent capacity giving rise to air and water conditions that make it an excellent medium for bacterial as well as for plant growth. For hundreds of years farming in this country has been a fight between grassland soils encouraged by the farmer and forest soils which were the natural type formerly existing. The farmer has gained a complete victory and the forest has virtually disappeared from England. But land will still lose its fertility and revert to the forest type unless it is scientifically cultivated. This, Mr. Jacks points out, is done "by periodically 'resting' cultivated fields under grass *by manuring with humus of the grassland type* (the italics are ours), by draining and liming and by appropriate methods of cultivation" to retain the granular structure. The necessity for feeding back to the soil humus of the right characteristics derived ultimately from grass is the justification of the important proposals contained in Col. Temple's paper.

Plants obtain their organic food (CO_2) from the air, and their inorganic food (nitrogen, phosphorus, etc.) from the soil. Although we can—but often do not—return to the soil much of its mineral constituents in the form of organic manure, it is evident that the deficiency must be made up by artificial fertilisers. Do we use sufficient artificial fertilisers? Is it not a fact that we could immensely increase our war-time growth of food by increasing our consumption of them? Do we spend enough on agricultural research?

Mr. Jacks says that "there is no denying that the task of organically co-ordinating our immense physical and chemical powers over the soil is at present outside the range of our skill." But there is no apparent reason why a combination of human intelligence and artificial fertilisers should not provide a perfect source of nutriment for agricultural crops. Already we can do some things with artificials which are impossible with the less flexible organic manures. A late dressing of quick-acting nitrogenous fertiliser will increase the valuable protein content of grains, and there are distinct possibilities of using artificials to heighten vitamin production. Organic manures, it is said, yield healthy plants; artificials can yield better or worse plants than organics, according to the intelligence and skill with which they are used. Thus we come back to Colonel Temple's proposal that for normal farming we should do all in our power to feed back to the fields grass-land humus derived from sewage and selected household refuse. But we should also not forget that the mineral constituents required by crops can be added in the form of fertilisers produced by the chemical industry. Research has enabled us vastly to increase the productivity of the soil; further research will one day enable us to co-ordinate our physical and chemical powers over it.

NOTES AND COMMENTS

The Spirit of the Press

WESTMINSTER Abbey, the Houses of Parliament, and the British Museum were all seriously damaged by German bombs on the same night. Even this is only part of the story of the enemy's latest attempt to frighten Londoners out of their offices and homes. It has failed miserably as a hundred such attempts on future nights will fail against a spirit that is proving itself indomitable. THE CHEMICAL AGE, as the whole world knows, is published in the heart of the City of London, which was probably more seriously menaced by the Saturday night raid than by any that had gone before. This issue is published from the same spot, and London will continue to be the scene of its operations for the duration, no matter what new efforts at frightfulness the Germans may decide upon. The British Press at large has been in the forefront of the Battle of Britain from the beginning. With very few exceptions it has succeeded in maintaining continuous publication. Great structures and even national monuments may be laid low, but it is impossible to quench the spirit of a free British newspaper.

Post-War Economics

"SOME Post-War Problems, Foreign and Domestic" is the title of the second of the arresting series of pamphlets published by the Individualist Bookshop of which the first was Sir Ernest Benn's trenchant essay on "The Political Method." The author of the new contribution to "Post-War Questions" is Mr. W. W. Paine, director of Lloyds Bank and one of the most eminent contemporary writers on economic subjects. The greater part of this pamphlet is devoted to the problems, and more particularly those arising out of finance, with which, after the war, the nation will be confronted on the home front. His remarks are largely addressed to those who seem to imagine that when peace comes there is going to be a sort of millennium in which life will be easy and comfortable for all classes of the population. On the contrary, he argues, there is no section of the people that will not be acutely affected by the inevitable impoverishment which the war will bring and which can be overcome only by long years of self denial and hard work. In these circumstances he would regard any political campaign for the nationalisation of industry as disastrous. Mr. Paine proceeds to examine at some length and to criticise powerfully the often mooted scheme for the nationalisation of the banks. Here he is on ground that he has explored before with great authority, and he proves conclusively that the destruction of the present banking system would be to take British industry, and with it the national standard of prosperity, into the abyss. He thoroughly scarifies the argument of people calling themselves the new economists that the root of all evil is "bank-made" money as opposed to Government-made money. He brands as a complete fallacy the expedient by which producers of all kinds must be completely self-supporting without help from the banks during the process of production. One of the great merits of this timely contribution is the simplicity of Mr. Paine's language which makes it easy for one and all to understand what is, in essence, an abstruse argument in the higher economics.

Exports—Now and to Come

SPEAKING in London last week, Mr. Harcourt Johnstone, M.P., Secretary of the Department of Overseas Trade, said that the British, as the pioneers of world trade, had a high standard to maintain. In 1938 our export trade had reached the immense total of £471,000,000 plus £62,000,000 of re-export goods. In spite of the loss of continental markets, of the "blitz" on this country, and of enemy action on our trade routes, the export figures for 1940 showed the amazing total of £413,000,000. Moreover the level of export trade this year had been higher than it was towards the end of last year. We should not forget that the new American Act was "Lease and Lend" not "*Give*," and we must continue our efforts to supply America with as much as possible of the things she needed so as to keep the adverse balance as low as possible. Canada, Australia, the other Dominions and Colonies were all supplying raw materials to this country and we in exchange must supply them with the goods they need from us. It was therefore necessary, he said, to export essential goods of the greatest value compatible with the labour and raw material required for their manufacture. We had a large volume of Argentine trade before the war and now that country as well as other South American countries was supplying us with raw materials and food, and it was vitally necessary to keep the balance as far as possible. Where a foreign country had not sufficient sterling we had to ration the quantity of goods we supplied to them. A third of our present export trade was made up of parcels of £100 and less value. Turning to the future, Mr. Johnstone said that the future of British export trade was in the field of high-class specialised articles. He had no hesitation in saying that British craftsmanship was the finest in the world. The trade we should lose was for the lower grades of goods, but we need not fear any challenge if the manufacturers and workers maintained their present standard and skill for these high grade articles. Our war weapons were superior in quality to any in the world. We must maintain that high standard when we again turned our full attention to peace-time products so as to continue to get our share of trade.

Pure Research after the War

IN his James Forrest Lecture to the Institution of Civil Engineers, Professor Andrade gave to a body of men whose business it is to deal with practical problems, a lucid account of some abstruse investigations in the realm of pure science which up to the present appear to have little direct practical application, other than to explain known behaviour. The explanation of this behaviour does not enable us to alter it. Having successfully kept a large body of practical men interested in theoretical speculations and laboratory experiments for an hour, Professor Andrade pointed out that after the war there is bound to be a demand for an ever-increasing concentration on applied research. There will be need for better processes, for new industries, and a demand that science shall help to solve the practical problems of the world by providing means whereby those who wish to work may do so. He made a plea that technical bodies such as the Institution of Civil Engineers, and other major Institutions who would be consulted upon the research work to be done, should give their voice in favour of allowing a certain amount of pure research to be conducted. He asked that they should not inquire always too strictly into the practical object in view, but that they should realise that abstract investigations often lead ultimately to profound changes in technology. With Professor Andrade's plea we have the fullest sympathy. It has always been the policy of THE CHEMICAL AGE, and we feel that most chemists and chemical engineers will agree with it, to support pure research equally with applied research. Some examples of the seemingly unpractical nature of discoveries which have revolutionised the world were given in our leading article of April 26, and we feel sure that all the great engineering and technical bodies will recognise the importance of pure research after the war.

IN 1940 THE AMERICAN CRUDE SULPHUR INDUSTRY supplied the largest demand in its history, according to Mr. Langbourne M. Williams, jr., president of the Freeport Sulphur Company. Supplies included 1,795,000 tons for home consumption and 760,000 tons for export. High-octane petrol production increased consumption of sulphuric acid in the petroleum industry to a level above any year since 1932, when solvent refining methods were introduced. The increased use of alloy steels, and the growing emphasis on more rigid specifications in the steel industry, increased acid consumption for steel pickling by 50 per cent. since 1929, while consumption in the paper and rayon industries exceeded previous records.

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Petroleum Chemistry Symposium

Meeting of the American Chemical Society

THROUGH the courtesy of the American Chemical Society we are in a position to publish some abstracts of the papers presented at the meeting of the Division of Petroleum Chemistry, at St. Louis, Missouri, on April 7 to 11.

M. R. Cannon and M. R. Fenske, of the School of Chemistry and Physics, Pennsylvania State College, speaking on "Viscosity Measurement" describe a modification of the Ostwald viscometer which is particularly suitable for measuring the viscosity of opaque liquids. It is also designed for the purpose of obtaining data on shearing rate as a function of shearing stress. Such data are of fundamental importance in investigations of plastic fluids and lubricating oils at low temperatures. A lubricating oil with a pour point of −18° C. may be either a plastic fluid or a true Newtonian liquid in the neighbourhood of −18° C. This instrument can be used to determine the type of fluid and is of value in the study of effect of pour-point depressors, dewaxing, etc., on the shearing rate-shearing stress relationship.

"Some Improvements in Methods for Determination of Unsaturates in Hydrocarbon Gases" was the subject of a paper presented by R. F. Robey, C. E. Morrell, and B. M. Vanderbilt, of the Standard Oil Development Co. Catalytic hydrogenation as a method for the quantitative determination of unsaturates in gaseous hydrocarbon mixtures is found to be inaccurate under certain conditions owing to the fact that the lower hydrocarbons do not behave as ideal gases when either alone or in admixture with hydrogen. Corrections for the effect have been derived and presented in graphic form ready for use. Interference of tertiary olefines in the analysis for the gaseous conjugate diolefines by absorption in maleic anhydride is obviated by including a small amount of high-boiling primary or secondary amine with the anhydride. The reaction of piperidine with maleic anhydride is not quantitative in most cases. This has been ascribed to the very slow and incomplete reaction of one geometrical isomer.

Hydrocarbon Analysis

J. J. Savelli, W. D. Seyfried, and B. M. Filbert, of the Humble Oil and Refining Co., deal with "Methods of Light Hydrocarbon Analysis." Various methods for the analysis of mixtures of light hydrocarbons from methane to *n*-pentane have been studied and compared as to their accuracy and suitability for routine operations. The methods studied have included two types of columns for fractionation of the mixtures, a method utilising low-pressure fractional condensation, a dew-pressure method for *n*-butane-isobutane mixtures, and determinations of olefines by absorption in various bromine and sulphuric acid solutions and by catalytic hydrogenation. Synthetically prepared mixtures have been used and the methods have been compared with respect to their accuracy, ease, and time and material requirements. Various methods of sampling and handling light hydrocarbon mixtures have been studied and compared.

Existing quality tests for petroleum solvent naphthas, including solvency, volatility, physical properties, and proximate composition, are catalogued and appraised in a paper entitled "Quality Tests for Petroleum Solvent Naphthas" by E. H. McArdle and E. L. Baldeschwieler, of the Standard Oil Development Co. The importance of volatility or average molecular weight to the correct interpretation of any solvenry test result is stressed. The standardised kauri-butanol method —recently criticised in several discussions of solvency—is demonstrated to serve adequately as a measure of solvent naphtha performance. It is concluded that no additional solvency tests are needed, but that the development of a rapid and accurate method for determination of evaporation rate is lacking.

R. J. De Gray and E. P. Rittershausen, of the Socony-Vacuum Co., present a series of papers, the first of which is on the "Separation of Cobalt from Iron." By the addition of oxalic acid before precipitation of ferric hydroxide by ammonium hydroxide, occlusion and co-precipitation of the cobalt are prevented, they say, and a quantitative separation is effected. If the ratio of iron to cobalt is greater than 10 to 1, the separation is not complete. The iron, however, may be partially extracted as the chloride by ether to reduce the ratio to this figure. With only two successive ether extractions, and the final use of oxalic acid, as little as 0.1 per cent. of cobalt may be determined in a steel. The oxalic acid does not interfere with the colorimetric determination of either the cobalt or the iron.

Colorimetric Methods

They later discuss the colorimetric determination of iron, cobalt, sulphates, and lead. On the last subject Mr. De Gray has the co-operation of W. E. Price of the same company.

The thiocyanate method for iron, they consider, is suitable for routine work, to an accuracy of 0.05 mg. of iron, when the iron content is not over 0.4 mg. By precipitating the iron as ferric hydroxide and filtering, interfering elements are removed, and the salt concentration is controlled. Under these conditions, the colour obtained by dissolving the precipitate in hydrochloric acid may be used as an indication of the iron content. Both the yellow ferric chloride and red thiocyanate colours are measured photoelectrically, using a blue filter.

Cobalt may be determined with a limit of error of 0.06 mg. by the ammoniacal ferricyanide method, over the range of 0.5 to 4 mg. of cobalt. Larger samples can be handled by appropriate aliquot either of the final colour or the original sulphate solution. The time required from the sulphate solution to the final measurement is 10 minutes or less. Cobalt, as in paint driers, alloy steels, etc., may be separated from other cations by sulphide precipitations, etc., and from interfering anions by heating to fumes of sulphur trioxide. Except for the ferricyanide, the volumes of all the reagents need be measured only approximately.

For tetraethyl lead in petrol, the hydrochloric acid solution may be evaporated to about 5 ml., ammonium acetate added, lead chromate precipitated, filtered immediately at room temperature, re-dissolved in a strong salt solution, and its lead content estimated from the colour of the filtrate. With a photoelectric colorimeter, the method is accurate to 0.03 ml. of tetraethyl lead per gal., when a 100-ml. sample of petrol is used. The time between evaporation and final reading is about 15 minutes. For other lead analyses, the sulphate may be filtered, dissolved in the same ammonium acetate solution, and the colorimetric method applied. The accuracy is 0.25 mg. of lead.

By the addition of a solution of barium chromate to a solution containing a soluble sulphate, barium sulphate is precipitated. By the addition of ammonium hydroxide, the unreacted barium chromate is precipitated. Short periods of digestion of the barium sulphate are required, so the precipitated sulphate and chromate can be filtered immediately. The filtrate contains the soluble chromate liberated in the reaction. The colour of this filtrate may be measured photoelectrically, and the sulphate thus determined. The method is invalidated, however, by the presence of many salts, such as would be contributed by the use of Eschka mixture or a sodium peroxide bomb. Otherwise, it is accurate to 0.1 mg. of sulphur, and requires less than 5 minutes.

Apparatus for the Extraction of Metals

Their last paper is on "The Extraction of Metallic Constituents from Oil." This method describes the use of tetraethyl lead extraction apparatus for the quantitative extraction of the metallic constituents of new and used motor oils, extreme pressure lubricants, greases, paints, and paint driers. The sample is dissolved in a suitable organic solvent

immiscible in water. The metals are extracted into the aqueous layer by refluxing the mixture for the necessary length of time. The aqueous layer is drawn off and analysed for the metals it contains. This procedure eliminates the difficulties encountered in destroying the organic matter, and the errors involved in ashing compounds having volatile metallic oxides. No metals have been encountered that could not be handled by this method.

Determination of Sludge

G. O. Ebrey, Mellon Institute of Industrial Research, Pittsburgh, described a laboratory apparatus for clarifying oxidised or used mineral oils and for the determination of sludge. The clarifying or filter medium was two Seitz S-3 type asbestos discs through which the oil was forced by gas pressure applied while maintaining the oil and the apparatus containing it at the desired temperature. The applications of the method in the study of the changes occurring in used or otherwise oxidised oils were indicated. The construction and method of use of an apparatus for mineral oil sludge determination were described. The apparatus was of such design that an open-bottom metal cup was drawn down and sealed against a supported Seitz S-3 type asbestos disc which served as the filter medium. This Seitz disc acted in effect as a preformed asbestos mat.

Oxidation Problems

Paul G. Exline, of the Gulf Research and Development Co., and W. E. Kramer and John R. Bowman, of the Mellon Institute, studied "Oil Oxidation as Related to Lubrication." A machine was described for the observation of the lubrication characteristics of oils during the course of their oxidation. It comprised a full cylindrical bearing 1 in. long and 1 in. in diameter run continuously at constant speed and constant temperature under varying load. Many loading cycles were recorded, and load and torque continuously noted. The oil system was built in such manner that it might be blanketed with any desired atmosphere. Air and nitrogen were generally used alternately. Evidence presented indicated that oxidation increased the incipient seizure load. The effect was temporary, the seizure load decreased to near its initial value shortly after the air was displaced with nitrogen. In the case of an oil containing an antioxidant, no such phenomena were observed.

Investigating "The Viscosity of Ethylene and of Carbon Dioxide under Pressure," E. W. Comings and R. S. Egly, University of Illinois, say that the viscosity of ethylene vapour was measured at 40° C. and at pressures from 50 to 2000 lb./sq. in. The vapour was forced through a glass capillary by the weight of a pellet of mercury and the time of fall of the pellet determined. The viscometer was calibrated independently of the results on any other gas, but the calibration was checked by measurements on carbon dioxide vapour. The values were averages of a number of measurements made with several sizes of pellet. The maximum probable error was 2 per cent. below 1300 lb./sq. in. and 4 per cent. above that pressure.

The Gas Research Board

Important Step in Scientific Research

THE Gas Research Board, with offices at Gas Industry House, 1 Grosvenor Place, London, S.W.1, was registered on May 2, as a company limited by guarantee, without share capital and with an unlimited number of members, each liable for not more than £5 in the event of winding-up. The word "limited" is omitted from the title by licence of the Board of Trade.

The objects of the Board are to promote, assist and support research and other scientific work in connection with the gas and allied trades and industries; to print and publish books, papers, and periodicals; to collect, arrange, index, and publish information, etc. No person other than a British subject resident in the United Kingdom may be a member of the Council. The Association may, in general meeting, appoint a president and two vice-presidents, one vice-president to be nominated by the Council of the Institution of Gas Engineers and the other by the Council of the Society of British Gas Industries.

Executive Council

The first president is Sir David Milne-Watson, Bt., D.L., M.A., LL.D., governor of The Gas Light and Coke Co., and the first members of the Council are Mr. Edward Crowther, M.Eng. (Newcastle-on-Tyne), Mr. John E. Davis (London), Mr. George Dixon, B.Eng. (Nottingham), Mr. Edward V. Evans, O.B.E. (London), Mr. Harold Hollings, D.Sc. (London), Mr. Steven Lacey, B.Sc. (London), Mr. Cyril A. Masterman, M.A. (London), Mr. Thomas F. E. Rhead, M.Sc. (Birmingham), Mr. Harold C. Smith, J.P. (London), all of whom have been appointed by the Institution of Gas Engineers. The following are the members of the Council appointed by the Society of British Gas Industries: Mr. Alexander G. Grant, M.Sc. (Darlington), Mr. Harold Hartley, D.Sc. (London), Mr. Daniel M. Henshaw (Huddersfield), Mr. Rupert J. Rogers (Birmingham), Mr. Ernest W. Smith, C.B.E., D.Sc. (London), and Mr. Ernest West (Manchester). In certain circumstances the Committee of the Privy Council for Scientific and Industrial Research may, on the invitation of the Council, nominate not more than two additional members of the Council.

NEW DETERGENTS

MESSRS. NEWELL (CHEMICALS), LTD., of Waverley Mills, Hawick, Scotland, report the production of an entirely new spirit-soluble soap for use in dry cleaning, an important addition to the firm's range of soaps, solvents, and other detergent products, known under the name of "Newtrell." In view of the fact that research is continuing despite the war, and that only British raw materials are involved, the list seems likely to expand yet more within a comparatively short time.

Newtrell "C" is for use in boiling, dyeing and scouring of cotton, linen, rayon, etc., and is claimed to withstand continuous boiling at very high temperatures without "cracking." Only 0.25 per cent. on weight of goods is required, and the manufacturers state that it is possible to save about one-third of the usual requirements of caustic and soap. No soluble oils are required when Newtrell "C" is used in the dyebath, where its powers of penetration and levelling are excellent. It prevents the formation of lime soaps and other insoluble compounds, and where these have already formed on the machines, it will gradually remove them and prevent other deposits from forming.

Newtrell "W" is for degumming silk and as an assistant in the dyeing and scouring of silk, rayon, woollen and worsted, hosiery, knitwear, etc. It saves one-third soap and leaves the yarn or goods with a vastly improved "handle." It prevents the injurious action of alkali whilst enhancing its scouring properties, this being particularly noticeable on goods which are usually "yellowed" by alkali, and prevents the formation of lime soaps. When used at full strength it will remove spots of grease, tar, etc., and it should be so used on goods which have not been scoured, otherwise a short time must be allowed for it to dry out.

For the removal of spots from finished goods Newtrell "SM" should be used. This is a non-inflammable, water-white liquid which will remove grease, tar, paint, etc., and will dry out immediately.

Newtrell "P.E.N." is a highly concentrated and powerful penetrating agent giving instant "wetting-out" to all fabrics in hot or cold solutions. It is used in the proportion of approximately 4 oz. per 100 lb. of goods, is non-injurious even to the most delicate fabric. Newtrell "P.E.N." is in liquid form and is supplied in tins containing 10 lb., drums containing 50 and 100 lb., and casks containing 500 lb.

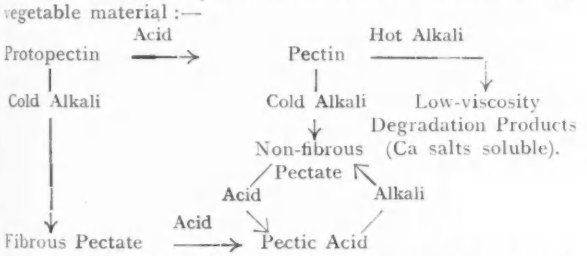
The Uses of Pectin

A Versatile Vegetable Colloid

PECTIC substances occur in practically all vegetable materials. As extracts of wood, straw, etc., they have been used to control the crystallisation of (*e.g.*) ammonium chloride, by which means "dog-tooth" crystals may be obtained with certainty and even crystals four or more inches in length exhibiting remarkable flexibility. Pectin from apples and other fruits has been marketed for years as an aid in the gelation of jams, and this versatile colloid can further be used, actually or potentially, in adhesive manufacture, in emulsifying, as a gelatinising agent of food products generally, as an assistant in spray drying, as a constituent of cosmetics, shaving creams and dentifrices, as a disintegrating agent in pills and tables, and as an ingredient of greaseless ointments, iodine jelly, etc. It is also said to improve the quality of the product when used in viscose spinning solutions.

Since pectic acids are derivatives of polymerised galacturonic acid it is not surprising that their chemical properties are not very well defined and depend to some extent on the source from which the acids have been obtained and largely on the methods of extraction and purification. Consequently information as to the behaviour of pectins from specific sources is much to be desired.

Some account of the production of pectic acids and pectates from citrus fruits together with the description of several novel uses and a fuller account of some older uses has been published by Baier and Wilson (*Ind. Eng. Chem.*, 1941, *33*, 287). The authors systematise the rather vague relations between the various products by the following diagram (taken from the paper) in which protopectin is the insoluble substance in which the pectic substances are combined in the vegetable material :—



Two pectic acids and their salts (pectates) of respectively low and high viscosities (relative viscosities of 0.5 per cent. sols being respectively 1.4 and 4.5-6.0 in a modified Ostwald viscometer) are in particular described.

Of the more or less established uses, that in spray-drying is detailed. The drying of fruit juices is rendered difficult by reason of the stickiness of the product, but by the incorporation of an infusible colloid it is rendered practicable. Colloids such as acacia tend, however, to redisperse when the product is dissolved in water and result in a slimy sensation in the mouth. Sols of a suitable pectate are satisfactory in the main requirement of facilitating spray-drying, but the pectic acid which forms by reaction with the generally acid fruit juice is not redispersible after drying and the slimy effect is avoided. In non-acid juices the presence of calcium in the juice, by the formation of insoluble calcium pectates, generally results in similarly satisfactory behaviour.

Contrary to previous workers (*e.g.*, McKinney, *J.S.C.I.*, 1926, *45*, 301T), the authors consider that the pectic acids with which they deal are almost pure polymers of galacturonic acid. This is in any case the bulk of the molecule and hence pectic acid is a very suitable raw material from which *d*-galacturonic acid may easily be prepared (*see* Link and Dickenson, *J. Biolog. Chem.*, 1930, *86*, 491, and Mottern and Coke, *J.A.C.S.*, 1939, *61*, 2701).

Regarding the use of pectin as a protective colloid, the authors stress the excellent results obtainable by mixing silver pectate with an alkali chloride in the preparation of colloidal silver chloride, with possible applications in photography, medicine, and oligodynamic sterilisation; recent tests by the authors show distinct improvement over argentoprotein at equal silver concentrations. A colloidal nickel hydroxide was prepared similarly from nickel pectate and alkali hydroxide, precipitated as a gel with alcohol, and the gel charred in absence of air, leaving an extremely finely divided nickel dispersed on a carbon skeleton, the catalytic properties of which might be worth investigation. On similar lines very finely divided pigments may be obtained, *e.g.*, by mixing a ferrocyanide with ferric pectate, and their application to printing inks is suggested since they show little tendency to penetrate paper.

Viscous-type pectates may be employed in the formation of extraordinarily firm gels at low concentrations, quite a strong gel being obtainable with 0.6 per cent. sodium pectate and 99 per cent. water. With a crude pectate the cost can be as low as $1 per ton of gel and the method of preparation may be as follows:—1 gm. sodium carbonate and 1 gm. sodium pyrophosphate are dissolved in 500 gm. water, and 0.25 gm. of a suitably finely divided calcium phosphate is added at the boiling point; 20 gm. crude pectate pulp is then added and the mixture is boiled for a further 3 or 4 minutes followed by a period of disintegrating agitation to obtain complete extraction of the pectin substance associated with the plant fibres contained in the crude pulp; an equal volume of 0.0625N citric acid solution is then added to the still warm sol and the whole is mixed quickly but thoroughly, when it sets to a continuous gel. Bases other than alkali metals give insoluble pectates which precipitate as gels above a concentration of about 0.1 per cent., but as flocculent precipitates below this concentration, and are satisfactory and economical flocculating or clarifying agents for fruit juices, etc.

Metallurgical Applications

Pectate pulp, by virtue of its effect on the viscosity of water, may be used to control the rate of quench in the hardening of steels and a concentration of about 0.5 per cent. in water has been found to be suitable. By varying the amount the rate of quenching may be varied to cover the gap between water and oil quenching with the additional advantage that the pectin is quite harmless and is non-inflammable. The latter property of these solutions can be of especial value in flame-hardening in which an oxy-acetylene flame is passed over the work followed by jets of the quenching liquid; for this treatment oil is not suitable, but variation in the rate of quenching may still be obtained by utilising pectin solutions.

In the rubber industry the addition of fibrous pectate to latex accelerates creaming, and impurities in the pulp and the latex are partially eliminated. A further use in the industry is in the preparation of sponge rubber by the method of Twiss and McCowan (B.P. 418,759; 1934) where a 0.5 per cent. gel of calcium pectate can be disintegrated and used as the core material carrying the rubber to be vulcanised. The lack of adhesion to and penetration of paper exhibited by pectates has been applied to the treatment of the surfaces of paper bags so that they can be used to carry, *e.g.*, asphalt, yet still allow the paper to be stripped easily from the asphalt, leaving a thin transparent film on the contents which is not usually disadvantageous. Similar paper was not, however, successful with milled rubber stock on the large scale, although it appeared satisfactory in the laboratory. Special films have been formulated to reduce the permeability of paper to air and to grease.

A novel use of these products as insecticides depends on the water-insolubility of nicotine salts of certain types of pectic acids. Suitable preparations are only slightly soluble in water and are toxic only to organisms, such as the larvæ of the silk moth and the codling moth, which are capable of digesting cellulosic materials.

Chemicals in Turkey

Notable Increase in Imports from the U.K.

LITTLE progress was made in the development of the Turkish chemical industry in 1940. Demand for all types of products was unusually heavy, but turnover was considerably below normal owing to import difficulties.

The chemical by-product plant at the new iron and steel works at Karabuk was put into operation during the year, about twelve months later than the iron and steel plant itself. The new chemical section turns out daily ten tons of ammonium sulphate, one and a half tons of benzol, and one ton of toluol. Figures for naphthalene production are not available. No progress was made with the caustic soda and chlorine plant at Izmit, nor with the sulphuric acid plant and superphosphate plant at Catalagzi. Most of the German-made machinery has been on the site for some time, but its installation has been delayed by the absence of certain small but essential equipment. The sulphuric acid plant at Keciburlu continued operations, with a normal output of 4000 tons. Work on the cellulose plant at Izmit, which has been under construction for some time, is moving slowly owing to the absence of technicians.

Imports of industrial chemicals, medicinal products, and dyes and paints in the first eleven months of 1940 are estimated at slightly under £T 7,450,000 (£1,400,000). Changes were made in the sources of imports: German merchandise found on the market during the year consisted mainly of stocks on hand at the outbreak of war and withdrawals from customs. Towards the end of the year small imports of pharmaceuticals were received from Germany under the Turkish-German commercial agreement providing for exchange amounting to £T 21,000,000, of which £T 2,500,000 was allotted for imports of chemical and pharmaceutical products. Chemical imports from Italy disappeared completely on Italy's entry into the war, and Great Britain and Rumania were the only other important suppliers. Imports from Rumania, principally alkalies and acids, were fairly steady throughout the year, while those from Great Britain were irregular, although by the end of the year imports were heavy and were again arriving fairly regularly.

The increase in the British trade since the outbreak of war has been particularly noteworthy, and in the period September, 1939, to September, 1940, imports are estimated at £150,000 against £51,000 in the previous twelve months. It is also reported that Turkish chemical imports from Great Britain in the last three months of 1940 were almost equal to the total for the previous twelve months. Rumanian imports are said to have totalled more than £90,000 for the first year of the war, but during the last three months of 1940 were declining rapidly and may be expected to have disappeared, following the German occupation of Rumania.

Alkali Consumption

Imports of alkalies up to December, 1940, were valued at more than £T 2,250,000, consumption of products in this group being estimated at 9000 tons. Caustic soda consumption is estimated at from 5000 to 6000 tons, that of sodium bicarbonate at 500 tons. Consumption of soda ash remained at 3000 tons, but with an increase in the proportion taken by the semi-governmental glass factories, which are said to be consuming about 2000 tons a year. Consumption of bleaching powder remained at about 400 tons. The increased demand for sulphuric acid from Government plants was supplemented by imports, which for the first eleven months of 1940 totalled 4493 tons, compared with 1200 tons during the whole of 1939. Sulphuric acid, furnished chiefly by Italy before her entry into the war, was later supplied chiefly by the United States. Imports of acetic acid increased sharply, and were furnished almost wholly by Greece. Italy, formerly the principal supplier of citric and tartaric acids, was replaced by Greece.

Demand for glycerine was heavy throughout the year, but stocks were low and prices high. No imports were, it is believed, received in 1940, and consumption was from stocks, which at the end of 1940 were said not to exceed 15 tons. Great Britain was not in a position to supply, owing to the embargo on glycerine exports.

Consumption of naphthalene in 1940 was wholly from existing stocks and from the production of the new Karabuk plant. No imports were effected during the year, although large quantities are said to have been ordered in Great Britain towards the end of the year when prices had risen 100 per cent. The consumption of solvents during the year was also largely from stocks; no imports were received, and it was reported that British firms were not prepared to supply many solvents because of transport difficulties. One exception was trichlorethylene, used in the olive oil industry, for which orders had been placed at the end of the year.

Oil and Colour Chemists

Regional Scheme to Continue

THE annual general meeting of the London Section of the Oil and Colour Chemists Association was held at the offices of the Federation of British Industries, Tothill Street, on May 8. The Chairman of the Section, Dr. H. W. Keenan, presided.

Dr. F. S. New, Mr. Reid Baker, and Dr. Raynes were elected to the committee. Honorary officials were re-elected as follows, and were cordially thanked for their past services: hon. secretary, Mr. David E. Roe; hon. treasurer, Mr. G. C. Attfield; hon. publications secretary, Mr. H. A. Idle; and hon. auditor, Mr. E. D. Wilson. Dr. H. W. Keenan was re-elected as chairman for the coming year.

The report of the committee for the session 1940-1 pointed out that during the summer of 1940 plans were worked out to decentralise the activities of the Association in the event of a state of emergency and the immediate London area was split up into 17 regions, with honorary regional secretaries appointed to each. At a meeting of the London section held on September 4, it was decided to put the scheme into operation immediately. The scheme had worked in a very satisfactory manner and many of the regions had arranged their own short papers. No fewer than 33 meetings had been held. Regional secretaries were congratulated on the success of their efforts. During the past year, the membership of the London section had increased by 27. The report and accounts were unanimously adopted.

Dr. Keenan, in expressing his appreciation of being re-elected, thanked all those who had assisted in the inauguration of the regional scheme and made it such a great success. At the same time he suggested that it would be necessary to rearrange the regions more conveniently and added that while the war lasted it was intended to take no notice of the difficulties that might be introduced, but to continue with the activities of the regions, and to hold regional meetings throughout the summer months.

At the conclusion of the meeting, Dr. G. F. Bowles presented a paper entitled "A Study of the Gelation of Polymerised Linseed Oil Films in the Presence of Cobalt." This was a Thesis approved for the Degree of Doctor of Philosophy in the University of London, and the work described in it represents the more fundamental part of the research work on certain aspects of drying printing inks conducted in the laboratories of Messrs. Lorilleux and Bolton, Ltd., Tottenham, London, since 1930.

EIRE MANUFACTURERS experienced considerable difficulty during 1940 in getting supplies of rock phosphate, and no ground mineral phosphates were available. Potash was also scarce, nor was any potassic superphosphate distributed, although other superphosphate was correspondingly increased. Small quantities only of basic slag were available. Sulphate of ammonia was much more plentiful, however, and the supply should suffice for 1941. Nitrate of soda and sulphate of potash are definitely short, the latter being reserved for fruit-growers. Compound manures will be used in fewer varieties and confined to use for potatoes and beet, being replaced otherwise by salt, which is reasonably abundant.

Process Pressure Vessels

Safety Precautions Recommended

A SYMPOSIUM on chemical engineering occupied the Division of Industrial and Engineering Chemistry, American Chemistry Society, on Wednesday, April 9, during the meeting at St. Louis, Missouri. Many papers of special interest were brought forward, but of most general interest was the contribution by R. C. Stratton, of the Travellers' Insurance Co., on "Guaranteeing the Life and Safe Operation of Process Pressure Equipment." We publish an abstract here by permission of the American Chemical Society. It will be noted that Mr. Stratton recommends many of the safety precautions advocated by J. Creevey in "Notes from Works Safety Jottings" (*see* THE CHEMICAL AGE, 1940-41, *passim*).

Pressure vessels, says Mr. Stratton, are in reality magazines of energy, and, unless correctly designed and constructed, properly installed, safely operated, and constantly inspected, may constitute a serious hazard. While operating experience as a whole with unfired pressure vessels has been relatively good, yet the wide variety of materials of construction and the multitude of substances handled makes the problem one requiring strict supervision in every chemical plant. There is a definite relationship between the vessel under pressure and the material in process. Compliance in design and installation with national or local codes is essential. Not only must the vessel be suitably located, but ample space must be allowed for all accessories, connections, controls for operation, repairs and inspection, and suitable safety equipment must always be provided. Vessels heated by steam, either in jackets or coils, must have these equipped with reducing and relief valves, placed on both the high and low sides of the reducer. Correct discharge capacity must be used. When the contents may be of a type liable to clog or to corrode the safety valves, special precautions are needed. When special alloys are required to prevent internal corrosion, control valves and relief devices must be of the same material. Rupture discs may be used where the relief demand is excessive, using the outlets in multiple. Inspection routine is needed to maintain continuous safe operation. A competent test engineer should make periodic surveys of the entire equipment and apply all the required safety tests. He should be empowered to shut down any vessel failing to pass his tests. It is of the utmost importance that the vessel be properly prepared for inspection if it is to be completed safely. The vessel must be cleaned, ventilated, or washed until no noxious or toxic materials are present, and proper internal ventilation must be supplied during the actual inspection. Safety equipment such as gas masks, rescue items, and emergency first-aid supplies should always be available. Accidents involving personnel or equipment must always be investigated. While this may seem *post-mortem* treatment, the data obtained may become important in subsequent construction and control.

Chemical Matters in Parliament

Salvage of Industrial Waste

IN the House of Commons last week, Mr. Lipson asked the Minister of Supply whether he was satisfied with the arrangements made at factories for the salvaging of industrial waste, and that scraps of metal, clean canvas wrappings, paper, cardboard, and empty food-tins were not being thrown into incinerators. He also asked if any steps were being taken to see that these arrangements were carried out.

Replying, Sir A. Duncan said that at factories under the control of the Ministry of Supply, arrangements were in force for salvaging industrial waste, as well as scrap metal, etc. In the case of private factories, attention had been drawn to the importance of salvage both by direct communication and by such methods as articles in the technical Press and investigation by the Ministry's Area Officers. Many firms had responded well, and any cases of alleged negligence which came to the notice of the Ministry were followed up. He was not aware of valuable material being thrown into incinerators. He added that regular visits were paid by his officers to see that the orders were efficiently executed.

Engineering Advisory Committee

The Lord President of the Council was asked by Captain Plugge whether he was aware of the statement recently made on behalf of the Government that the authorities were in touch with professional societies with a view to the possible establishment of a separate organisation working in the field of applied science and in close touch with the Scientific Advisory Committee, and that an announcement might be expected before long; and whether, in view of the fact that a number of leading professional scientific institutes had not yet been approached, he could give any more exact indication of what was intended.

Sir J. Anderson answered that he had appointed an Engineering Advisory Committee under the chairmanship of the Chancellor of the Duchy of Lancaster, the membership of which was settled after consultation with professional bodies representative of the engineering sciences. Particulars of the committee and its terms of reference were announced in the Press generally on April 30.

Starch Factory

Mr. Graham White asked the Parliamentary Secretary to the Ministry of Food whether any decision had been taken with regard to the proposed working of the Monikie starch factory.

Major Lloyd George said, in reply, that it had been decided that the Monikie factory should not be put into production for the present. The question would be reconsidered in consultation with the President of the Board of Trade, probably towards the end of this year. In the meantime it was proposed to use the premises for food storage.

Fertiliser Industry

Mr. Liddall asked the Minister of Labour whether he was aware that his department were unable to supply from the usual sources the necessary labour to ensure maximum production of fertilisers during the peak period of the fertiliser industry; that, subject to certain conditions, the Ministry was ready to direct labour of an agreed suitable type to the industry for three months; that, although applications were received for over 500 men under this scheme, only about 200 were now working; that a number of men directed under the scheme had left their employment without permission and many thousands of tons of fertilisers had not been made available to farmers for producing food for next winter; and what steps he was prepared to take to make the necessary labour available.

In a written reply Mr. Bevin stated that he agreed that where undertakings engaged in this industry adopted a specified minimum standard of wages and conditions he would direct labour to take the employment. About half of the firms concerned accepted the scheme and their demands for labour had been substantially met. He was taking the necessary steps to prosecute men who had left this employment for failing to observe the directions given. All possible steps were being taken to make good the deficiencies so caused.

Paraffin Re-Exports to Eire

In reply to a question by Mr. Wootton-Davies as to what extent paraffin wax and paraffin scale had been brought to ports in this country and transhipped to Eire, the Secretary for Petroleum said that re-exports and transhipments of paraffin wax and scale from this country to Eire had been limited to small quantities.

Personal Notes

MR. REGINALD CHARLES WOOLFALL, B.Sc., A.I.C., was married on May 3 at St. Andrew's Church, Bebington, to Miss Jean Florence Coathup.

DR. R. S. JANE has been elected chairman of the Montreal Section, Society of Chemical Industry, and DR. W. D. MCFARLANE vice-chairman.

MR. W. J. DARBY, who has been commercial director of I.C.I. (Plastics), Ltd., and also dyestuffs sales manager for the south-eastern division of the same company and managing director of Emco Dyestuffs, Ltd., has joined the board of Lewis Berger and Sons, Ltd.

At the sixth annual meeting of the South Yorkshire Section, Institute of Chemistry, held at Rotherham Technical College on May 6, officers for the year 1941-2 were elected as follows: Chairman, MR. B. W. METHLEY, F.I.C.; vice-chairmen, MR. A. H. DODD, M.A., F.I.C., and DR. E. GREGORY, M.Sc., F.I.C.; hon. treasurer, MR. W. W. STEVENSON, A.I.C.; hon. secretary, MR. G. PARKIN, A.I.C.

MR. PERCY PRITCHARD, managing director of the Birmingham Aluminium Co., Ltd., and other companies, has been awarded the E. J. Fox Gold Medal for 1941 by the Council of the Institute of British Foundrymen, in recognition of his scientific and technical contributions to the development of the foundry industry, particularly in light aluminium and magnesium alloys.

SIR SANTI SWARUP BHATNAGAR, O.B.E., D.Sc., F.Inst.P., F.I.C., Director of Scientific and Industrial Research, Calcutta, has been co-opted as a member of the recently appointed Industrial Research Utilisation Committee set up to consider how best to utilise the results of the work of the Board of Scientific and Industrial Research. The new committee will be presided over by the Hon. Diwan Bahadur Sir A. Ramaswami Mudaliar and includes Indian and European members.

OBITUARY

MR. JOHN HENRY COLLINS, who died recently, was senior partner in the firm of Hole and Hollingworth, manufacturing chemists, Mansfield.

MR. HENRY S. BROWN, whose death occurred recently at Paisley, was for a number of years associated with the management of the Ferguslie Fire Clay Works, Paisley. During recent years, he was chairman of the British Fire Clay Association.

LORD SUFFOLK, who was killed by enemy action last Monday, at the age of 35, had recently done valuable work for war-time science when he acted as liaison officer between the Director of Scientific Research (Ministry of Supply) and French scientists, until the collapse of France last year. His escape from Bordeaux, bringing with him important scientific records, was an adventurous one. Lord Suffolk took a B.Sc. degree in chemistry, with honours in pharmacology, at Edinburgh University in 1937; he had decided some six years ago to take up scientific farming on the large scale, having previously tried his hand at sheep farming, military service, and the merchant marine. He succeeded to the title of Earl of Suffolk and Berkshire at the age of 11 (his father having been killed in Iraq in 1917) and is himself succeeded by the six-year-old Viscount Andover.

New Control Orders

Storage Facilities

UNDER the Storage Facilities (Information) Order, 1941 (S.R. and O. 1941 No. 641), issued by the Board of Trade on May 12, owners of premises in Great Britain which have a floor area of 3000 sq. ft. or more and have at any time since January 1, 1938, been used for storing goods of any kind, whether they are now used for storage or other purposes, are required to give certain information about the premises. Such owners are requested to apply to their local Chamber of Commerce, any office of the Federation of British Industries or of the National Union of Manufacturers, or direct to the Registrar of Factory and Storage Premises, Board of Trade, Millbank, London, S.W.1, for a form of return on which the information may be given. The form must be completed and returned to the Registrar on or before June 2. Among classes of premises exempted from the provisions of the Order are those used mainly in connection with a factory and situated within a mile of that factory and those in respect of which a "return of factory premises" has already been made.

Call-Up of Apprentices

New Arrangements

ARRANGEMENTS are being made to defer the calling-up of apprentices in essential trades until the completion of their apprenticeship or until they attain the age of 20, whichever is the earlier. Application for such deferment must be made by the apprentice and his employer jointly, and must relate to a man under a regular apprenticeship for a term of years, whether under indentures, under written agreement, or by arrangement between the parties in accordance with the custom of the occupation. Oral agreements are not excluded.

Forms of application and detailed instructions may be obtained at local offices of the Ministry of Labour and National Service. Deferment will be granted only where the occupation for which the man is being trained is of first importance to the war effort.

British Chemical Prices

Market Reports

FIRM price conditions characterise all sections of the industrial chemical market, and the demand generally is on a good scale with fairly substantial quantities being delivered against contracts. The volume of inquiry for new business both for home and export has been moderate. The increase of 30s. per ton, made last week, in the convention scale of quotations for red lead and white lead is due it is understood to higher production costs; in other directions there are no important quotable changes in prices to record. There is a good call for most of the potash and soda products, and for oxalic acid, borax and formaldehyde. Active conditions continue to prevail in the market for coal tar products, and, with few exceptions, the tone throughout remains firm.

MANCHESTER.—Price conditions continue firm in virtually all sections of the Manchester chemical market. The demand for textile chemicals during the past week has been on a fair scale, though it is expected that the cuts in production for the home markets will shortly be reflected in the movement of a wide range of chemicals for use in the bleaching, dyeing and finishing trades. Paper-making chemicals are in quiet demand, but the call for contract supplies from most of the other leading consuming industries in the district is fairly active. The majority of the tar products are showing a very strong undertone and substantial quantities are being taken up.

GLASGOW.—In the Scottish heavy chemical trade business still keeps about normal, with the slight improvement in both home and export trade being maintained. Prices have kept steady, but firm, for some considerable time now.

Price Changes

Antimony Sulphide.—Golden, 10d. to 1s. 10d. per lb. Crimson, 1s. 8½d. to 2s. pr lb.

Creosote.—Home trade, 5½d. to 5¾d. per gal., f.o.r., maker's works.

India Rubber Substitutes.—White, 5 15/16d. to 8¾d. per lb.; dark, 5 9/16d. to 8¼d. per lb.

Lead, Red.—Scale of prices up 30s. per ton all round.

Lead, White.—Scale of prices up 30s. per ton all round.

Pyridine.—90/140° 17s. per gal.; 90/160° 13s.; 90/180° 4s. to 5s. per gal., f.o.b.

Xylol.—Commercial, 3s. 6d. per gal.; pure, 3s. 9d.

Equipment for the automatic control of temperature, pressure, humidity and level is described and illustrated in a pamphlet just issued by MESSRS. NEGRETTI AND ZAMBRA, whose head offices are at 122 Regent Street, London, W.1.

General News

THE SECRETARY FOR PETROLEUM asks that purchasers of paraffin should be reduced to the minimum.

UNTIL FURTHER NOTICE the address of the Chemical Workers' Union is 225 Clive Road, West Dulwich, London, S.E.21; telephone, GIPsy Hill 2152.

MANCHESTER SECTION of the Oil and Colour Chemists' Association has decided to hold informal luncheon meetings of a purely social character at a city restaurant on the second Thursday in each month.

THE SUGGESTION OF A LEEDS HAIRDRESSER that hair clippings should be collected has been adopted by the Ministry of Supply, who are hoping to find an outlet for the clippings in connection with plastics.

"POLISHING OF SCRATCHES ON GLAZES" is the title of an interesting pamphlet by Dr. Felix Singer, recently published by the author. As well as an examination of the chemical and physical nature of grinding and polishing processes, the pamphlet contains an important estimation and criticism of the various hardness scales (Mohs, Seebeck, Rosival, and Brinell).

BETWEEN 20 AND 30 vacant or derelict factories in Northern Ireland have been started once more in useful production, and three new factories erected as a result of the New Industries Act, 1937, according to a statement by Mr. J. Milne Barbour, Minister of Finance in Northern Ireland, in his recent budget speech.

MOBILE SHOWER-BATHS for people whose homes have been damaged are being put into service in places where they are required by Lever Brothers, Port Sunlight. Units consist of a motor-car with trailer attached, the latter containing an oil-fired boiler. Dressing shelters and shower shelters with spray baths, as well as duckboards, are set up alongside the trailers as required.

THE CURIOUS EXPERIENCE of a certain fertiliser merchant who advertised high-grade meat-and-bone meal containing ammonia and phosphates, in his local paper, has recently been reported. Some days later the firm received a request from a Gloucestershire lady for 6 lb. of "beef" with as little fat and bone as possible. She had assumed that the meat-and-bone meal was a supply of ration-free meat. The ammonia, of course, was a preservative.

THE BOARD OF TRADE has extended until May 31 the period during which traders may insure their plant, machinery and other business equipment under the War Damage Act, 1941. All traders who have not already done so should insure without further delay. If, after the end of May, they have no policy of insurance, they will receive no compensation if their goods sustain war damage and, in addition, if their goods exceed £1000 in value, they will be liable to penalties. Applications for policies should be made to any of the principal fire insurance companies or members of Lloyd's.

Foreign News

A GLYCERINE AND SOAP FACTORY, located near Tehran, Iran, was completed in June, 1940. The plant is now reported to be capable of producing 2 metric tons of glycerine, 30 metric tons of soap and 5000 candles daily.

INDIAN MANUFACTURERS of sodium silicate and sulphuric acid have been advised that there is an opportunity to capture a share of the East African trade in those commodities as a result of European supplies being to a large extent discontinued.

A NEW PLANT compressing 1500 cu. m. of methane a day has begun operation at Rovigo, Italy. Another compressor and other necessary apparatus are reported as being about to be installed, to bring daily production to 10,000 cu. metres.

THE TOTAL QUANTITY OF DOMESTIC CRUDE BARYTES sold or used by United States producers has risen irregularly from less than 100,000 tons a year before 1914 to 383,609 short tons, with a value of $2,344,103, in 1939. Missouri is the leading State both as to quantity and value of sales, while Georgia is second.

EXPORTS OF POTASSIUM CHLORIDE from Barcelona to the United States during 1940 amounted to 27,328 short tons. It is known that substantial quantities of Spanish potash were exported in 1940 to other countries, but particulars of the trade have not been made public.

From Week to Week

ACCORDING TO A REPORT emanating from Rome, Italy is now producing glycerine from treacle in the sugar factories of the Padua district. It is claimed that Italy's entire requirements of glycerine for explosives are satisfied by the amount thus produced.

THE EXPLOSION OF A KETTLE in which oil of mustard was brewing caused the death of a chemical engineer in the Edwal Laboratories, Chicago. Three other persons, including the president and vice-president of the company, were injured by the blast.

ACCORDING TO INFORMATION received from New York, production of Mexican quicksilver during the first 10 months of 1940 amounted to 9622 bottles. This is an increase of approximately 50 per cent. over the output during the corresponding period of 1939.

EXPERIMENTS ON THE FERMENTATION of molasses to butyl alcohol, acetone, and acetic acid, and on the preparation of yeast, conducted during the past year at the Imperial Institute of Sugar Technology, Cawnpore, are showing the practical possibility of developing these into paying industries in India.

THERE WAS A DECLINE of Rs. 4,87 lakhs or 10 per cent. in India's imports from the United Kingdom during 1939-40, while her exports to the United Kingdom advanced by Rs. 16,62 lakhs or 29 per cent. Among articles of export, paraffin wax improved from 4600 to 5700 tons, while lac dropped from 151,000 to 72,000 cwt.

THE PRODUCTION OF BARYTES in the Union of South Africa rose from 317 short tons in the first 9 months of 1939 to 532 tons in the first 9 months of 1940. In the 1939 period, local sales, which equalled the production, had a value of £413; but in the 1940 period local sales amounted to only 485 short tons valued at £688.

RECENT PUBLICATIONS of the Smithsonian Institution, Washington, D.C., include Nos. 3557-60, reprinted from the Report for 1939 (already reviewed in our columns). These deal with "The Use of Solar Energy for Heating Water"; "The Fringe of the Sun: Nebulium and Coronium"; "Our Knowledge of Atomic Nuclei"; and "Spectroscopy in Industry."

SOUTH AFRICA is the world's leading producer of corundum. The war has given new impetus to the industry which in the past has fluctuated widely between prosperity and depression. Production during the first nine months of last year rose by nearly 100 per cent. to 3178 tons. There are some excellent deposits of the ore in the country, widely spread, and rarely more than 20 feet below ground.

THE NATIONAL DEFENCE ADVISORY COMMISSION of America has requested manufacturers to conserve certain essential defence metals, including zinc. Following this request, Mr. J. W. Fraser, president of Willys-Overland Motors, Inc., announced that it had been estimated by his company that a saving of at least 5 lb. of zinc per unit might be possible in the future output of motor cars. Assuming that the rest of the motor industry co-operates similarly and that this figure represents a minimum average reduction in zinc used by motor car manufacturers, he suggested that at least 20,000,000 lb. of zinc might be conserved for the defence purposes.

Forthcoming Events

THE FINAL MEETING OF THE SIXTEENTH SESSION of the Electrodepositors' Technical Society will take place at 3.30 p.m. on May 19, at the Northampton Polytechnic, St. John Street, Clerkenwell, London, E.C.1, when Dr. J. R. I. Hepburn will present a paper entitled "Silver Coatings on Non-Metallic Surfaces."

THE 31ST ANNUAL MAY LECTURE of the Institute of Metals will be delivered by Dr. F. Simon, Reader in Thermodynamics at Oxford University, at Oxford on May 28 at 3.30 p.m. in the Clarendon Laboratory. The title of the lecture will be "The Significance of Low Temperature Research." It will deal with Dr. Simon's own experimental work in the last few years on the properties of matter at the very lowest temperatures. Cards of invitation can be obtained on application to the secretary of the Institute of Metals, 4 Grosvenor Gardens, London, S.W.1.

U.S. Action against Nazi Influence

German Dye Trust Funds Attached

THE United States Department of Justice secured an attachment, on Friday last week, against the funds in the United States of the German Dye Trust (I.G. Farbenindustrie), states a report from the New York correspondent of *The Times*. The Attorney-General described the organisation as probably the most powerful single factor of German influence on American industry. He said its funds had been attached because the Dye Trust had refused to appear in Court, to answer an indictment under the Sherman anti-trust law, on the ground that it was not doing business in the United States and was not subject to American law as a corporation. When asked whether the Department of Justice had reason to believe that payments amounting to $250,000, to be made to the Dye Trust to-day by American licencees of its patents, might be sent out of the country, he said yes. The Dye Trust was among six corporations indicted on January 30 on charges of violating the anti-trust laws through the control of the American magnesium industry.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Declaration of Solvency

BELVEDERE CHEMICAL CO., LTD. (D.S.F., 17/5/41). Declaration of solvency filed, April 22.

Company News

Sternol, Ltd., have announced a net profit for 1940 of £10,286 (£11,365). £7345 is carried forward (£7185).

Manbré & Garton, Ltd., are maintaining their interim dividend of 5 per cent., less tax.

Genatosan Laboratories (Eastern), Ltd., Loughborough, announce that the name of the company has been changed to Eastern Pharmaceutical Association, Ltd., as from May 5.

The British Match Corporation, Ltd., has declared a final ordinary dividend of 5¼ per cent., making 8 per cent. for the year (7¾ per cent.). Net profit was £391,566 (£451,269), and carry forward £89,922 (£87,000).

No dividend is to be paid at present on the ordinary stock of **Lever Brothers & Unilever, Ltd.**, according to a preliminary statement. After making provision for taxation, etc., the profit for 1940 will amount to about £6,600,000, which, after payment of all preferential dividends, leaves a surplus for appropriation of approximately £2,250,000. The profit for 1939 was £6,742,053, and the balance for ordinary distribution £2,404,276. These results would justify the payment of at least the same dividend (10 per cent.) as in 1939, but, in view of the close relationship between the company and Lever Brothers & Unilever N.V., consideration must be given to the results of both companies.

Chemical and Allied Stocks and Shares

A STEADY undertone has been maintained in all sections of the Stock Exchange, and earlier gains in industrial and other securities have been quite well maintained at the time of writing. In many directions, however, quotations were not adequately tested by business, but the absence of selling assisted sentiment. In fact, many leading securities were so firmly held that they were in short supply in the market, and prices tended to respond sharply on only very moderate demand.

Imperial Chemical at 30s. 6d. more than held last week's improvement, and the 7 per cent. preference units were higher at 31s. 7½d.; the report and accounts for the past year will be issued by the time these notes are read. Hopes that the dividend may be maintained continued to assist the units of the Distillers Co., which were around 63s. 6d., while United Molasses were steady at 23s. 9d., on further consideration of the results for the past year's working. On the other hand, Dunlop Rubber at 31s. 6d. were higher on balance, but failed to keep best prices recorded in the past few days, the disposition being to await the impending dividend statement. Lever & Unilever were little changed at 20s. 6d., despite the absence of a distribution for the past year; earnings must be considered as being at a good level, having regard to the conditions ruling, but it has been decided to conserve resources. Business in B. Laporte was shown at 58s. 9d., and Fison Packard continued to be quoted at 32s., while Greeff-Chemicals Holdings 5s. ordinary units were maintained at 5s. 7½d.

Borax Consolidated deferred were firm at 28s., but Barry & Staines were easier at 26s. 3d., awaiting the dividend announcement. Nairn & Greenwich remained at 52s. 6d., although in other directions Wall Paper Manufacturers deferred units made the higher price of 21s. 9d. There was again a fair amount of activity in British Plaster Board 5s. ordinary shares, which were around 14s.; Associated Cement were 58s. 9d., and Pinchin Johnson 17s. 9d. Elsewhere, Cooper McDougall & Robertson remained around par. Courtauld's have been active at the higher level of 31s. 6d., partly owing to the forthcoming increase in rayon yarn prices. A steady tendency was shown in British Oxygen at 63s. 9d., and in British Aluminium at 39s. 9d. Aided by the good impression created by the maintenance of the dividend at 20 per cent., Cellon 5s. ordinary shares remained firm at 12s. 6d., while awaiting publication of the financial results; British Glues 4s. ordinary units were 6s. 3d., and British Drug Houses 22s. 6d. Business around 2s. 7½d. was recorded in the 2s. shares of British Industrial Plastics, and among other smaller-priced shares, General Refractories were again quoted at 8s. 1½d. The apparently attractive yield continued to draw attention to British Oil & Cake Mills preferred ordinary, which were 39s., while in advance of the dividend announcement, United Premier Oil & Cake 5s. ordinary were quoted at 8s. 9d. Aided by the dividend, Babcock & Wilcox had a firm appearance at 40s. xd., and other iron and steel issues were steady, including Dorman Long at the slightly better price of 17s. 4½d., and Tube Investments, which were 89s. "ex" the interim dividend. In other directions, Murex remained a firm feature at 82s. 6d., and awaiting the preliminary figures for the past year's working, both Cerebos and Reckitt & Sons' ordinary shares had a steady appearance.

Boots Drug 5s. ordinary shares were 36s., and were firmly held on hopes that the distribution may be at the same rate as for the previous year. Moreover, Timothy White's were more active around 18s., having remained under the influence of the maintained dividend. Sangers 5s. ordinary shares were quoted at 15s. 6d. Dealings at slightly over 30s. were shown in British Match, while elsewhere, Turner & Newall rallied to 68s. 9d., pending declaration of the interim dividend. Oil shares developed an easier tendency, following a reaction in Anglo-Iranian and Burmah Oil.

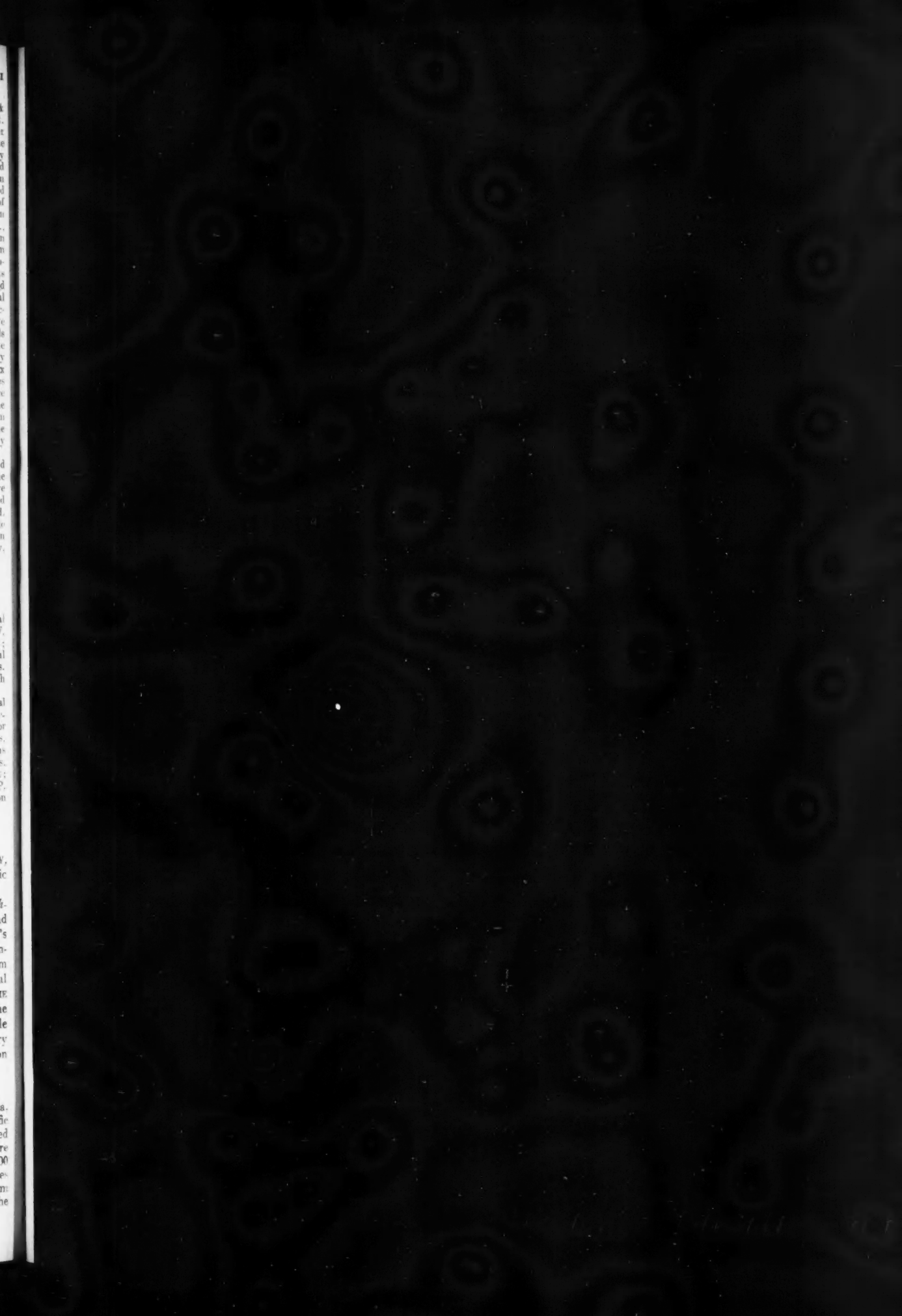
New Companies Registered

Richards & Davies, Ltd. (366,957).—Private company. Capital £250 in 250 shares of £1 each. Objects: to acquire from Geo. F. Richards an invention relating to a special coal oil atomising unit; to carry on the business of manufacturers of and dealers in coal oil and other oils, etc. Directors: Geo. F. Richards; Thos. Davies. Secretary: Vernon Adams. Solicitor: John S. Carr, 15 North Church Street, Sheffield.

Gnomist Company, Ltd. (366,974).—Private company. Capital £1000 in 1000 shares of £1 each. Objects: to enter into an agreement with Archibald St. John Austin to acquire any patents or rights relating to the treatment of glass fabrics and other materials. Manufacturers and treaters of viscose and other sheets, skins, films and solutions, glass and other transparent or translucent substances, porcelain, fabric, silk, textiles, etc. Subscribers: W. H. Brickett; G. E. Saunders. Directors: Archibald St. J. Austin, Reginald P. Fraser. Solicitors: Goulden Mesquita and Co., Mark Lane Station Buildings, E.C.3.

A CHEMIST'S BOOKSHELF

JOURNAL OF THE ELECTRODEPOSITORS' TECHNICAL SOCIETY, Vol. xvi (1939-40). London: Northampton Polytechnic Institute. Pp. 117. 21s. (to members 15s.).

Volume XVI of the *Journal of the Electrodepositors' Technical Society* has just been published by the Society in bound form. It contains in full the papers presented at the Society's meetings between December, 1939, and April, 1940, and includes the masterly presidential address of Dr. Ellingham on "The Metals" as well as an account of last year's annual meeting. Many of the papers have been noticed in THE CHEMICAL AGE shortly after their delivery, and all reach the accustomed high standard. The volume contains invaluable information for all technicians interested in the chemistry and physics of metal surfaces, and its admirable production makes it a pleasure to read.

ALUNITE DEPOSITS at Lake Chandler, Western Australia, are being examined by the Australian Council for Scientific and Industrial Research. It is estimated that the lake bed contains, at least, 2,000,000 tons of clay, consisting of more than 60 per cent. alunite, which would yield some 250,000 tons of potassium sulphate or potassium chloride. Besides providing a commodity which is practically unobtainable from overseas, the conservation of foreign exchange by the utilisation of these deposits would approach £A 5,000,000.